Complex Properties of Disordered Quantum Systems

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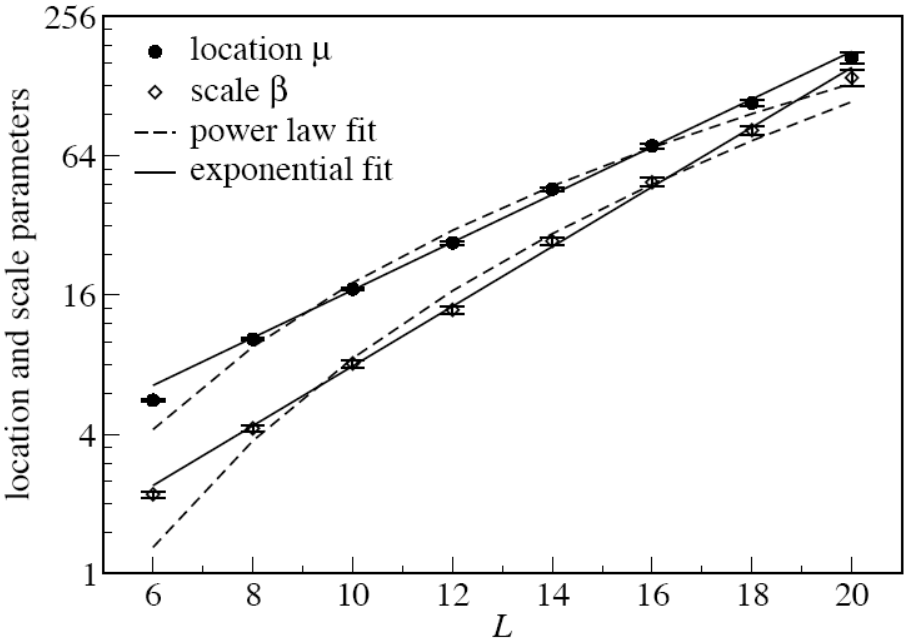
Flat histogram sampling methods ameliorate the slow convergence of standard Metropolis sampling in numerical simulations of complex and glassy systems. We showed that while flat histogram sampling does speed up convergence greatly for a two-dimensional spin glass, the convergence time still grows exponentially with system size.



Typical convergence time as well as sample-to-sample variations grow exponentially with system size L for flat histogram sampling

P. Dayal, S. Trebst, S. Wessel, D. Wuertz, M. Troyer, S. Sabhapandit, S.N. Coppersmith, "Performance Limitations of Flat Histogram Methods and Optimality of Wang-Landau Sampling," Physical Review Letters **92**, 097201 (2004)